



# RISE OF NATION ACADEMY

"We Create the Impeccable Creature"

## Test Paper

Standard - X

Subject – Mathematics

Date – 13/10/2019

Max. Marks - 80

Times – 3 hrs.

Min. Marks – 40

### 1 Mark Questions (Objective):

Q.1 What is the HCF of the smallest composite number and the smallest prime number?

- (i) 2      (ii) 4      (iii) 3      (iv) 5

Q.2 If one zero of the quadratic polynomials  $x^2 - 5x - 6$  is 6 then find the other zero.

- (i) 1      (ii) 3      (iii) -1      (iv) 6

Q.3 Find the co-ordinate where the line  $x - y = 8$  will intersect y – axis.

- (i) (0, -8)      (ii) (0, 6)      (iii) (8, 0)      (iv) (0, 2)

Q.4 For what value of k, is 3 a root of the equation  $2x^2 + x + k = 0$ ?

- (i) 20      (ii) -21      (iii) 25      (iv) 22

Q.5 Find the value of a, so that the point (3, a) lie on the line  $2x - 3y = 5$ .

- (i)  $a = \frac{1}{3}$       (ii)  $a = \frac{2}{3}$       (iii)  $a = \frac{1}{5}$       (iv)  $a = \frac{1}{6}$

Q.6 Let  $\triangle ABC \sim \triangle DEF$  and their areas be respectively  $64 \text{ cm}^2$ . If  $EF = 15.4 \text{ cm}$ , find BC.

- (i) 12.5      (ii) 11.2      (iii) 10      (iv) 10.5

Q.7 Evaluate  $\frac{\sin 18^\circ}{\cos 72^\circ}$ .

- (i) 2      (ii) 5      (iii) 1      (iv) 7

**Q.8 Find the distance between the points (0, 5) and (-5, 0).**

- (i)  $5\sqrt{3}$       (ii)  $5\sqrt{1}$       (iii)  $5\sqrt{5}$       (iv)  $5\sqrt{2}$

**Q.9 If  $\frac{1}{2}$  is a root of the equation  $x^2 + kx - \frac{5}{4} = 0$ , then find the value of k.**

- (i) 2      (ii) 1      (iii) 5      (iv) 3

**Q.10 If  $\alpha$  and  $\beta$  zero of  $p(x) = x^2 + x - 1$ , then find  $\frac{1}{\alpha} + \frac{1}{\beta}$ .**

- (i) 1      (ii) 2      (iii) 5      (iv) 7

### 1 Mark Questions (Subjective):

**Q.11 Find the zeros of the polynomial  $p(x) = 4x^2 - 12x + 9$ .**

**Q.12 The product of two consecutive integers is divisible by 2. Is this statement true or false? Give reason.**

**Q.13 Find the value of k which the equation  $x^2 + k(2x + k - 1) + 2 = 0$  has real and equal roots.**

**Q.14 Find the ratio in which the line segment joining the points (-3, 10) and (6, -8) is divided by (-1, 6).**

**Q.15 ABC is an isosceles triangle right – angled at C. prove that  $AB^2 = AC^2 + BC^2$ .**

**Q.16 If  $\sin(x - 20)^\circ = \cos(3x - 10)^\circ$ , then find the value of x.**

**Q.17 Find the ratio in which the line segment joining the points P (3, -6) and Q (5, 3) is divided by the x – axis.**

**Q.18 What will be the nature of roots of quadratic equation  $2x^2 + 4x - 7 = 0$ ?**

**Q.19 Find the quadratic polynomials whose zeros are -3 and -5.**

**Q.20 Express 32760 as product of its prime factors using factor tree.**

### 2 Mark Questions:

**Q.21** If  $\alpha$  and  $\beta$  are zeros of polynomial  $p(x) = x^2 - 5x + 6$ , then find the value of  $\alpha + \beta - 3\alpha\beta$ .

**Q.22** If  $(1, 2)$ ,  $(4, y)$ ,  $(x, 6)$  and  $(3, 5)$  are the vertices of a parallelogram taken in order, find  $x$  and  $y$ .

**Q.23**  $\triangle ABC \sim \triangle DEF$  such that  $AB = 9.1$  cm and  $DE = 6.5$  cm. If the perimeter of  $\triangle DEF$  is 25 cm, what is the perimeter of  $\triangle ABC$ .

**Q.24** Given that  $\sin\theta = \frac{a}{b}$ , find the value of  $\tan\theta$ .

**Q.25** Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding medians.

**Q.26** Check whether  $(5, -2)$ ,  $(6, 4)$  and  $(7, -2)$  are the vertices of an isosceles triangle.

### 3 Marks Questions:

**Q.27** If one zero of polynomial  $(x^2 + 9)x^2 + 13x + 6a$  is reciprocal of the other, find the value of  $a$ .

**Q.28** Solve the following linear equations:  $152x - 378y = -74$  and  $-378x + 152y = -604$ .

**Q.29** If the equation  $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$  has equal roots, show that  $c^2 = a^2(1 + m^2)$ .

**Q.30** Find the coordinates of the points of trisection of the line segment joining  $(4, -1)$  and  $(-2, -3)$ .

Q.31 In fig ,  $AB \parallel PQ \parallel CD$ ,  $AB = x$  units,  $CD = y$  units. Prove that  $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ .

Q.32 Prove that the ratio of area of two similar triangles is equal to the ratio of the square of their corresponding sides. Using the above result do the following:

Diagonals of a trapezium ABCD with  $AB \parallel DC$  intersect each other at the point O. If

$AB = 2CD$ , Find the ratio of the areas of triangles AOB and COD.

Q.33 Find an acute angle  $\theta$ , when  $\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta} = \frac{1 - \sqrt{3}}{1 + \sqrt{3}}$ .

Q.34 Prove the following identity, Where the angle involved is acute angle for which the expressions are defined.

#### 4 Marks Questions:

Q.35 Show that  $5 - \sqrt{3}$  is an irrational number.

Q.36 In an equilateral triangle ABC, D is a point on side BC such that  $BD = \frac{1}{3} BC$ . Prove that  $9AD^2 = 7AB^2$

Q.37 Karan travels 300 km to her home partly by train and partly by bus. He takes 4 hours if he travels 60 km by bus and the remaining by train. If he travels 100 km by bus and the remaining by train, he takes 10 minutes longer. Find the speed of the train and the bus separately.

Q.38 Two taps running together can fill a tank in  $3\frac{1}{13}$  hours. If one tap takes 3 hours more than the other to fill the tank, then how much time will each tap take to fill the tank?

Q.39 Prove that the area of an equilateral triangle described on a side of a right – angled isosceles triangle is half the area of the equilateral triangle described on its hypotenuses.

Q.40 Prove that:  $\frac{\operatorname{cosec}\theta + \cot\theta}{\operatorname{cosec}\theta - \cot\theta} = ((\operatorname{cosec}\theta + \cot\theta))^2 = 1 + 2\cot^2\theta + 2\operatorname{cosec}\theta\cot\theta$ .